

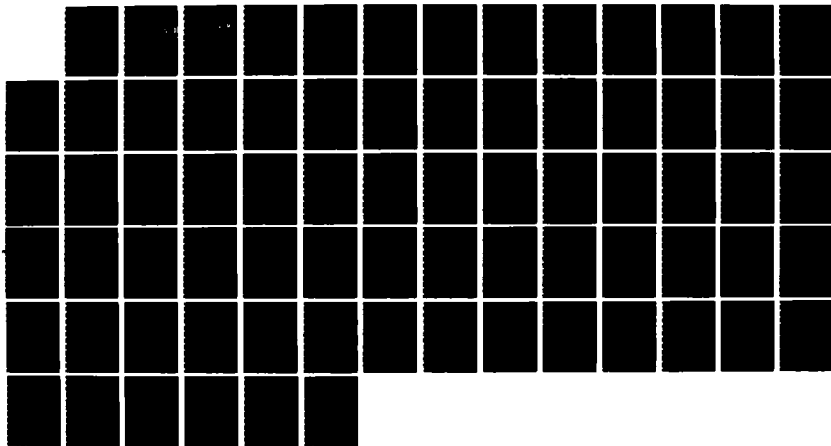
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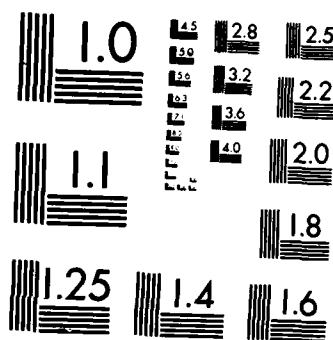
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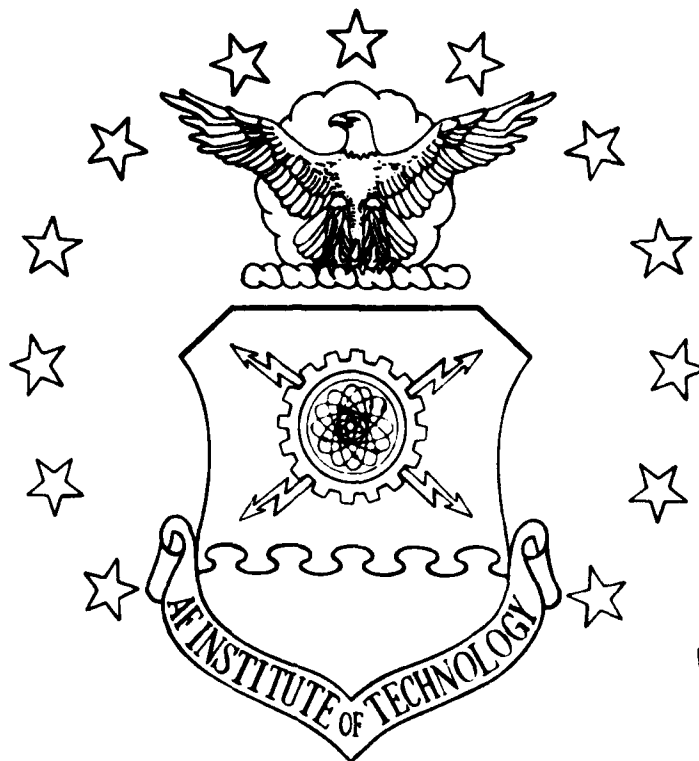
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CONTINUATION PAY (ESCCP) AND THE  
RETENTION OF AIR FORCE ENGINEERING OFFICERS

THESIS

Douglas C. Miller, B.S.  
Captain, USAF

AFIT/GEM/LSB/86S-18

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ENGINEERING AND SCIENTIFIC CAREER CONTINUATION PAY (ESCCP)  
AND THE RETENTION OF AIR FORCE ENGINEERING OFFICERS

THESIS

Presented to the Faculty of the School of Systems and Logistics  
of the Air Force Institute of Technology  
Air University  
In Partial Fulfillment of the  
Requirements for the Degree of  
Master of Science in Engineering Management

Douglas C. Miller, B.S.

Captain, USAF

September 1986

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## Preface

The purpose of this study was to provide those Air Force officials concerned with improving the retention of Air Force engineering officers with information about the impact of Engineering and Scientific Career Continuation Pay (ESCCP) on the retention of these officers. The immediate need for this information is to provide some insight into the possible effectiveness of ESCCP as an impetus to retention, but should be valid for other applications.

In performing the research and writing this thesis I had a great deal of help from others. I am deeply indebted to both my thesis advisor, Major John A. Ballard, and my reader, Captain Benjamin L. Dilla, for their continuing patience and assistance in times of need. A word of thanks is also owed to Dr. Charles R. Penno (AFIT/LSH) for his assistance in getting this study initiated and his overall support. I also wish to thank my wife Marsha, and two sons, Nicholas and Ryan, for enduring those many occasions I had to sit in front of the word processor. Finally, I praise God for His Holy Spirit, which enabled me to complete this thesis with patience and perseverance.

Douglas C. Miller

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### Abstract

Air Force development and civil engineering officers (n=120) were surveyed to determine how they perceived Engineering and Scientific Career Continuation Pay (ESCCP) and how pay, in general, affects their career decisions. Results indicated that these officers perceived ESCCP to be important in their career decisions if (1) they were not really sure about their intent to make the Air Force a career, (2) they had less than eight years of commissioned service, and (3) they were less than 31 years old. Out of the 19 motivational factors examined, salary was perceived to be the 17th most influential in career decisions. In addition, Air Force engineering officers perceived that they received less pay than their civilian counterparts. This study indicated that the use of ESCCP can influence the career decisions of some Air Force engineering officers.

**ENGINEERING AND SCIENTIFIC CAREER CONTINUATION PAY (ESCCP)  
AND THE RETENTION OF AIR FORCE ENGINEERING OFFICERS**

**I. Introduction**

**General Issue**

Recruitment and retention of engineering officers have been problems in the Air Force for many years. According to the Fifth Quadrennial Review of Military Compensation (9:370), the numerical shortage of Air Force engineering officers reached a peak of 1255 during fiscal year (FY) 1981. These shortages resulted from not meeting accession goals, rated supplement drawdown, and below average retention rates. To offset this problem, the following recruitment and retention programs have been employed: Undergraduate Engineer Conversion Program; College Senior Engineer Program; Air Force Reserve Officer Training Corps scholarships; Airman Education and Commissioning Program; cross-flow of qualified engineers back to engineering duty; selective recall to active duty; selective retention of officers deferred for promotion; and Engineering and Scientific Career Continuation Pay (ESCCP).

Today, Air Force recruitment and retention of engineering officers have reached record highs. According to Capt Johnston, Officer Retention Branch, Air Force Manpower & Personnel Center (AFMPC), overall critical manpower shortages have been eliminated in all Air Force engineering disciplines, although some disciplines (e.g., electrical)

are not fully manned (16). In most cases, overall manning requirements have been met by overmanning lieutenant authorizations (e.g., over 300 percent for those authorized in the civil engineering utilization field (10)) to make up for the deficiencies in the ranks of captain, major, and lieutenant colonel. This results in a very low experience level throughout the Air Force engineering officer ranks -- the major reason for ES CCP. ES CCP was designed to reduce deficiencies that exist in the Air Force engineering (and scientific) officer ranks of captain, major, and lieutenant colonel.

Even with the improved manning level of Air Force engineering officers, the issue of retention continues to be of concern to top level Air Force management. Lt Gen John A. Shaud, Air Force Deputy Chief of Staff for Personnel, while addressing a House subcommittee about Air Force recruiting and retention efforts in the FY87 budget, stated:

We are concerned about the impact a robust healthy economy, characterized by lower unemployment rates, improved job stability, comprehensive benefits in the private sector, and increased demand for high technology skills, will have on our ability to recruit and retain high quality people (2:3).

Despite the fact that Air Force retention rates remain above average, they have been declining since FY84 and are predicted to continue this downward trend (2:3).

#### ES CCP

ES CCP was implemented in the Air Force by Air Force Regulation (AFR) 36-31, Special Pay: Engineering and Scientific Career Continuation Pay (ES CCP), dated 8 October 1982. Air Force engineering officers, who have qualified for ES CCP, have received up to \$12,000 in return for a four-year obligation.

To qualify for ES CCP, Air Force engineering officers must have from 4-12 years of total active federal commissioned service (TAFCS); completed at least three years of engineering duty; be assigned to a critically undermanned Air Force specialty code (AFSC); possess a critical shortage academic degree; and hold a fully qualified AFSC requiring an engineering degree (8:2-3). A more detailed listing of eligibility criteria is at Appendix A.

Academic degrees qualifying as critically short have varied from year to year. Initially, critical shortage degrees included: aeronautical engineering, aerospace engineering, architectural engineering, architecture, astronautical engineering, electrical engineering, electrical technology, electronics engineering technology, and mechanical engineering (12:15). According to Capt Johnston (16), as manning levels have improved certain academic degrees were dropped from the initial critical shortage list. By FY85 only electrical engineering remained. Finally, in FY86, no academic degrees remained on the critical shortage list.

In the past, Air Force engineering officers assigned to the following AFSCs, when considered critically undermanned, were potentially eligible for ES CCP: 26XX, scientific utilization field; 27XX, acquisition program management utilization field; 28XX, development engineering utilization field; 29XX, program management utilization field; 49XX, information systems utilization field; 55XX, civil engineering utilization field, and; 91XX, biomedical sciences utilization field (12:15). This study was limited to Air Force development and civil engineering officers because they accounted for 85 percent of the total ES CCP recipients in FY82 (9:377).

### Specific Problem

Air Force managers concerned with improving the retention of Air Force engineering officers need more information about the impact of ES CCP on the retention of Air Force engineering officers (3:42). This study provides information on how Air Force engineering officers perceive ES CCP, and how they report ES CCP affects their career decisions. Consequently, this study should provide some insight into the possible effectiveness of ES CCP as an impetus to retention.

### Investigative Questions

1. How do Air Force engineering officers perceive that ES CCP has affected their past decisions to remain in the Air Force?
2. How do Air Force engineering officers perceive that the discontinuance of their receiving ES CCP will affect their future decisions to remain in the Air Force?
3. How do Air Force engineering officers perceive their overall salary influencing their career decisions as compared to other factors?
4. Do perceptions about pay vary between different groups of Air Force engineering officers by AFSC, academic degree, or military rank?

### Scope and Limitations

1. The conclusions drawn from this study are based on self-reported data provided by individual Air Force engineering officers.
2. This study was limited to Air Force engineering officers who have been eligible to receive ES CCP in the past and who were still on active duty. That is, it does not include the perceptions of those officers eligible to receive ES CCP in the past who have separated from

the Air Force, or those officers in the same career fields, but who were not eligible to receive ES CCP for various reasons (e.g., they possessed the wrong academic degree). Although the perception of these officers would be extremely valuable in assessing the overall impact of ES CCP, they are beyond the scope of this study.

3. This study was limited to Air Force engineering officers in the development engineering utilization field (28XX) and the civil engineering utilization field (55XX). In addition, Air Force engineering officers with a duty AFSC (DAFSC) of 286X or 287X were excluded as most were not eligible for ES CCP because they were already receiving aviation career incentive pay. Air Force engineering officers with a DAFSC of 552XC or 552XD were also excluded as most were not eligible because they would not typically possess shortage academic degrees.

4. This study was limited to Air Force engineering officers with a TAFCS date (TAFCS D) from 1 October 1970 through 29 September 1981. These are the TAFCS D limits for Air Force engineering officers who could have potentially received ES CCP to date, according to AFR 36-31.

## II. Literature Review

### Introduction

One of the major concerns of military managers, with regard to personnel management of the Air Force engineering officer structure, is the retention of skilled junior officers. This concern is a direct result of the closed personnel management system used by the Air Force. That is, middle and higher level management positions are filled from within the organization, rather than recruiting qualified people from outside as is done in private industry. The replacement cost, to the Air Force, to groom and train its own engineering leaders from within the existing officer corps after eight years service is about \$266,127, according to a 1983 estimate (20:3, 12). This replacement cost does not consider the resulting loss of experience when the eight-year captain is replaced by a new second lieutenant (20:17). Understanding the results of research performed in the area of retention would be beneficial to military managers.

To understand retention, personnel managers, behavioral scientists, and management practitioners have performed extensive investigations of the causes of employee turnover. Important literature reviews of turnover have been performed by Porter and Steers (26) in 1973; Forrest, Cummings, and Johnson (14) in 1977; Price (27) in 1977; and Mobley, Griffeth, Hand, and Meglino (23) in 1979.

This chapter will discuss several aspects of the literature on turnover applicable to this study. First, a generic definition of turnover by Price will be given, and then categorized into four types,

as described by Bluedorn in his taxonomy of turnover. Second, the Mobley et al. conceptual model of employee turnover will be presented. This will include a schematic representation of the primary variables and processes, and a brief description of its major characteristics. Third, three models on the importance of pay to an individual, as developed by Lawler, will be addressed. This will also include schematic representations of the processes and a brief discussion of their primary characteristics. Finally, six Air Force studies relating career intent and other major factors to turnover behavior will be covered.

#### Concept of Turnover

According to Price, "turnover is the degree of individual movement across the membership boundary of a social system" (27:4). Bluedorn (6:647-648) states that Price's definition of turnover is "a useful conceptualization because it indicates that turnover is a process universal to all organizations," but that it provides only a generic meaning. Bluedorn suggested that there are four different types of turnover. His taxonomy of the four types are illustrated in Figure 1.

In Bluedorn's (6:648-649) taxonomy, there are two directions of movement -- into (accessions) or out (separations) of the organization. Also, there are two initiators of this movement -- the individual himself (voluntary) or someone other than the individual (involuntary). An example of Type I, Voluntary Separations, is where an individual decides to leave a job on his or her own. An example of Type II, Voluntary Accessions, is when an individual decides to take a job. Conscription into the Armed Forces is an example of Type III,

Initiator of Movement	Direction of Movement	
	Into the Organization (Accessions)	Out of the Organization (Separations)
The Individual (Voluntary)	Type II  Voluntary Accessions	Type I  Voluntary Separations
Other Than the Individual (Involuntary)	Type III  Involuntary Accessions	Type IV  Involuntary Separations

Figure 1. Bluedorn's Taxonomy of Turnover (6:648)

Involuntary Accessions. Finally, the firing of an employee is an example of Type IV, Involuntary Separations. The focus of this study is Bluedorn's Type I turnover; that is, the type of turnover characterized by those people, who of their own choice, separate from an organization.

#### A Conceptual Model of Employee Turnover

Mobley et al. (23:493-494) developed a conceptual model of turnover based on "the belief that turnover is an individual choice behavior;" that is, Bluedorn's Type I classification of turnover. It goes beyond the traditional satisfaction-turnover relationship used in past models. Instead, Mobley et al., cited by Meola and Koechel, state that the model "attempts to capture the overall complexity of the turnover process" (21:20). Their model, as illustrated in Figure 2, identifies the primary variables and the process of employee turnover.

The Mobley et al. turnover model is based on the belief that "the immediate precursor of behavior is thought to be intentions...therefore, the best predictor of turnover should be intention to quit" (23:517).

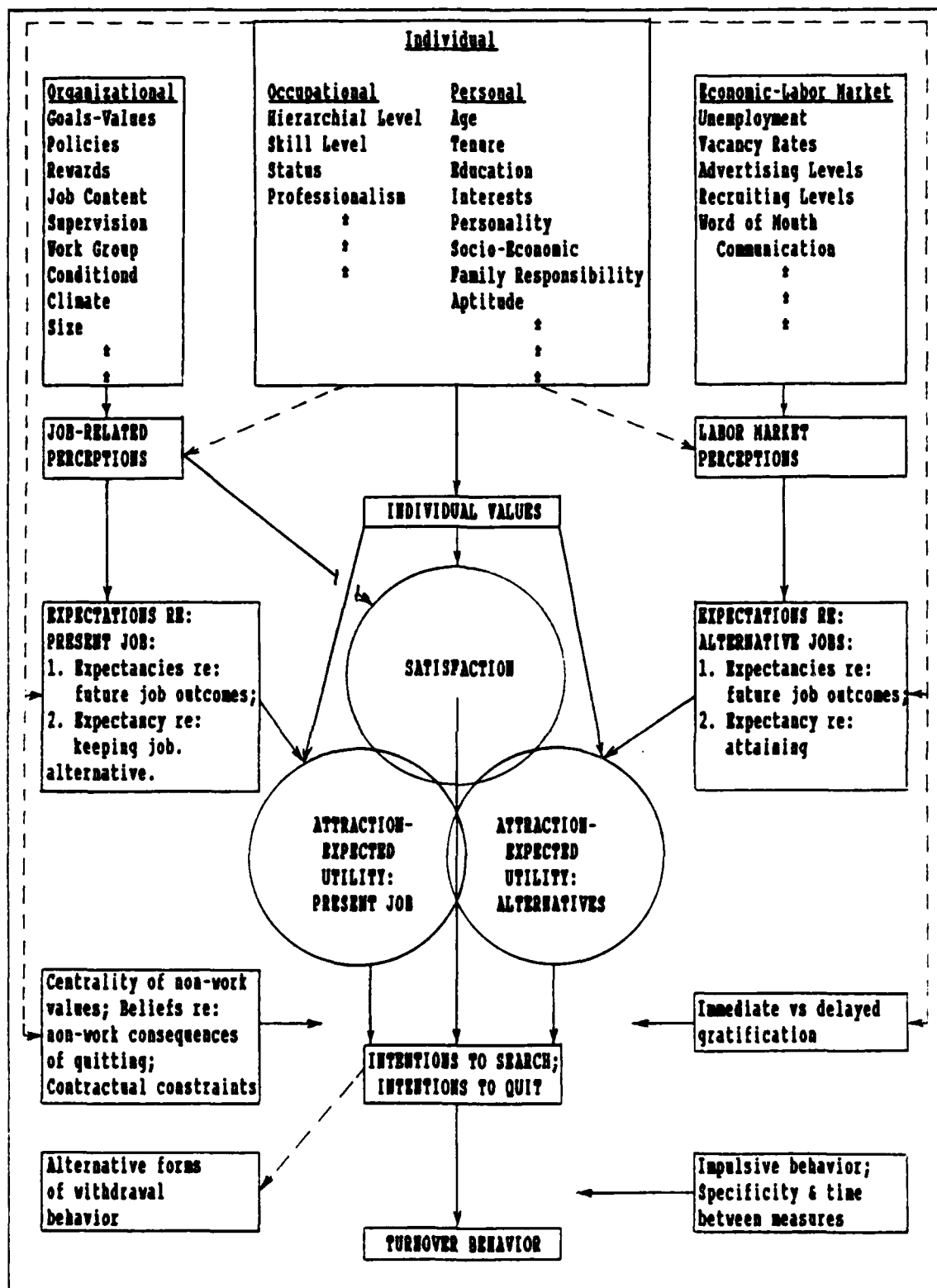


Figure 2. The Mobley et al. Conceptual Model of Employee Turnover (23:517)

Kraut (17:242); Miller, Katerberg, and Hulin (22:515); and Waters, Roach, and Waters (30:60) support this idea with similar statements. As illustrated in Figure 2, intentions to quit are determined by an individual's perceived satisfaction, attraction-expected utility of present job, and attraction-expected utility of alternative jobs. Satisfaction is based on how the individual perceives their present job when evaluated against their individual values. This perspective is present oriented. The attraction-expected utility of present job is future oriented. It is viewed as a function of the individual's perceived future satisfaction from their present job, and the ability to retain that job. The attraction-expected utility of alternative jobs is also future oriented. It is viewed as a function of the individual's perceived future satisfaction from the alternative jobs, and the ability to obtain the jobs.

How much an individual values pay, in relation to other factors, is very important in determining the influence of pay on his or her perceptions regarding the three determinants of intentions to quit mentioned above. The amount of pay an individual currently receives, and the amount he or she believes should be received affects the perceived satisfaction determinant. With regard to the attraction-expected utility of both the present and alternative jobs, the individual's perception of his or her pay potential from present and alternative jobs, respectively, will influence the perception of these two determinants.

### The Importance of Pay to Retention

Pay is typically thought of as performing a number of functions that contribute to organizational effectiveness. Primarily it is considered a reward that can be used to make employees feel satisfied with their job, motivate them, gain their commitment to the organization, and keep them in the organization [18:1].

According to this statement by Lawler, pay should be able to satisfy, motivate, and increase an individual's commitment to stay with an organization, and thus improve retention. While this idea has some support in the literature [see, e.g., Price (27:68-70), Porter and Steers (26:155-156), and Lawler (18:232)], the degree of influence will be dependent upon both the importance of pay to the individual and the individual's satisfaction/dissatisfaction with the pay he is currently receiving.

Lawler (18:26-27) has developed a model, illustrated in Figure 3, which attempts to define the process of determining the importance of pay to the individual. It shows that the importance of pay to an individual is a function of his or her needs (i.e., physiological, security, social, esteem, autonomy, and self-actualization), and the ability of pay to help satisfy those needs (either directly or indirectly). The importance of each need is influenced by the satisfaction of lower-level needs, and the degree to which the need itself has been satisfied. The ability of pay to help satisfy a particular need is influenced by an individual's experience with transforming pay into a specific desire (e.g., knowing that physiological needs can be satisfied through pay by buying food). Assuming that pay is important, to some degree, to most people, the next step is to determine if an individual is satisfied with the pay he or

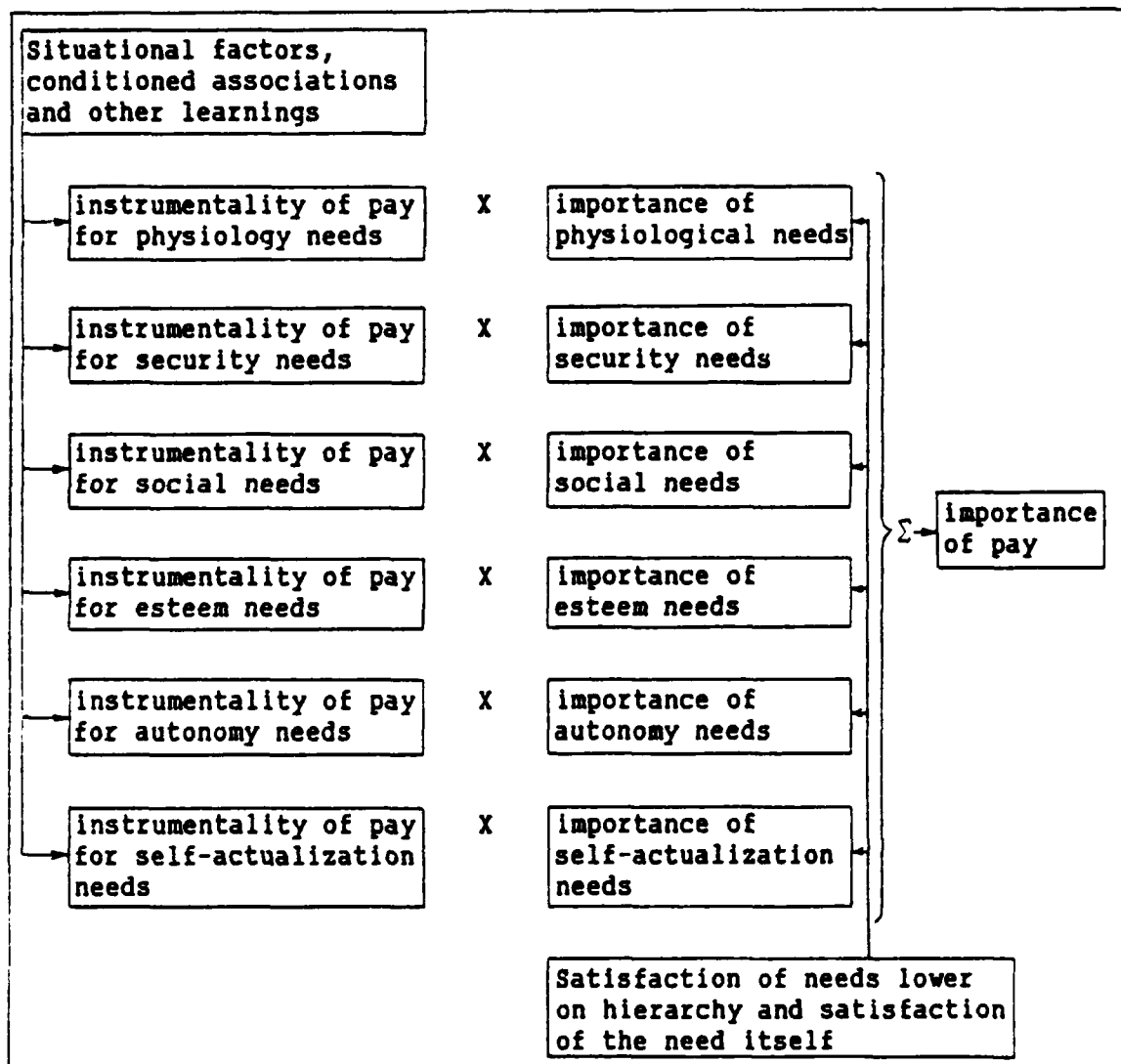


Figure 3. Lawler's Model of the Importance of Pay (18:27)

she is currently receiving.

Lawler (18:214-216) has developed another model, illustrated in Figure 4, which attempts to define the process of determining whether or not an individual is satisfied with the pay he or she is currently receiving. It shows that pay satisfaction/dissatisfaction is a function of what a individual perceives he or she should be receiving and perceptions of what is actually being received. If an individual's

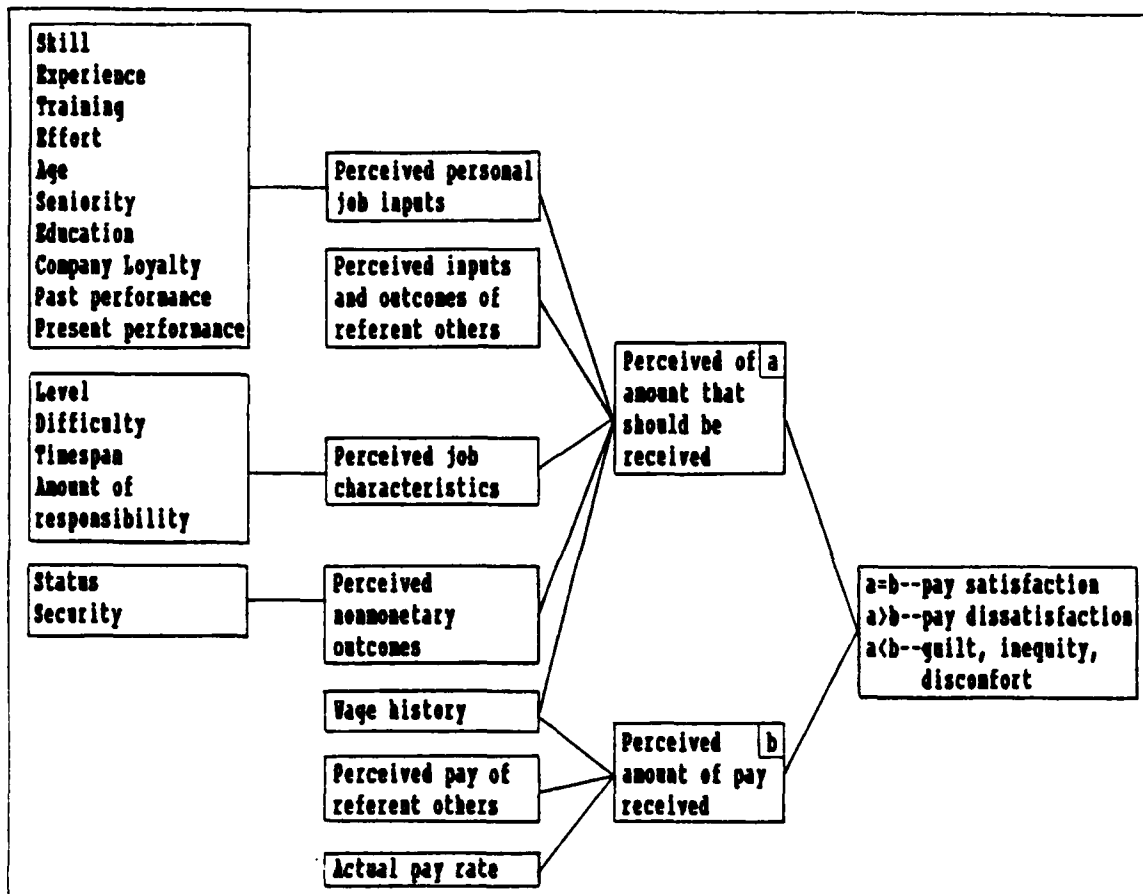


Figure 4. Lawler's Model of the Determinants of Pay Dissatisfaction (18:215)

actual pay is equal to what he or she perceives it should be, satisfaction will result; but if it is less, dissatisfaction will result. The perceived amount of pay that an individual believes he or she should receive is influenced by: (1) the individual's perceived personal job inputs, (2) the perceived personal job inputs of referent others, (3) the perceived par rate of referent others, (4) the perceived characteristics of the job, (5) the perceived nonmonetary rewards, and (6) the individual's wage history. The perceived amount of pay that an individual actually receives is influenced by: (1) the individual's wage history, (2) the perceived pay of referent others, and (3) the

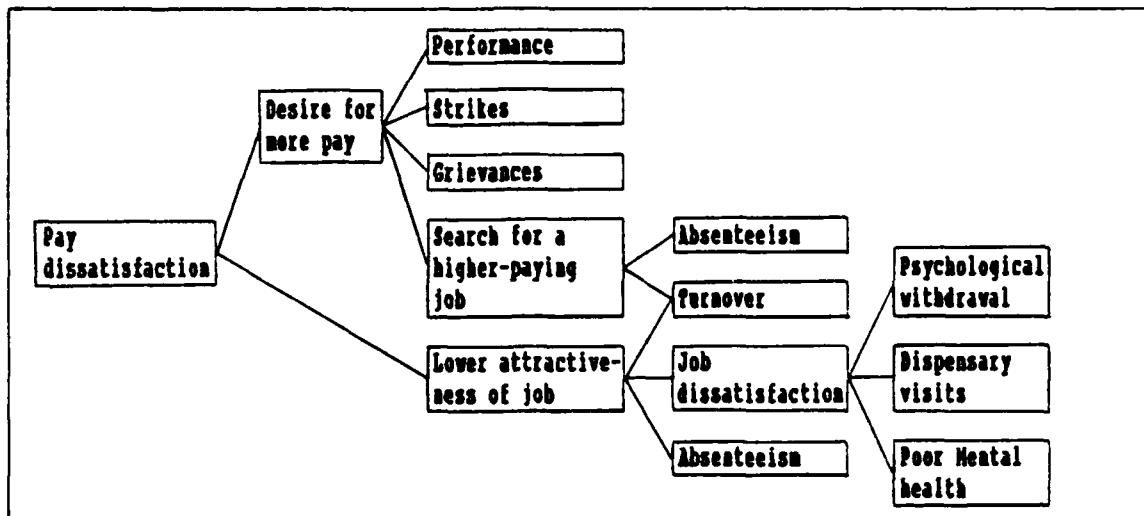


Figure 5. Lawler's Model of the Consequences of Pay Dissatisfaction (18:233)

individual's actual pay rate.

Lawler (18:231-232) attempts to define the consequences of pay dissatisfaction with a third model, illustrated in Figure 5. It shows that pay dissatisfaction results directly in either a desire for more money or a decrease in the job's attractiveness, both of which can lead to turnover. Finally, Lawler states "it follows from this that turnover should be associated with pay dissatisfaction" (18:233).

#### Selected Research Studies

As mentioned earlier, career intent is thought to be the best predictor of turnover. Two Air Force studies have examined expressed career intent versus turnover in a longitudinal fashion.

In 1971, Faye Shenck and Jim Wilbourn reported an analysis of 4,006 Air Force junior officers based on data collected in 1964 and 1968 (28:1). Shenck and Wilbourn found that 89 percent of those officers that expressed an intention to remain in the Air Force did so over the

five-year span of the study. For those officers expressing an intention to leave the service, 93 percent did so over the same period (28:2). The researchers concluded "that an individual is fairly consistent in his expressed career intent and his actual career decision" (28:2).

In 1975, Bill Alley and Bruce Gould reported an analysis of 50,000+ Air Force enlisted personnel based on data collected from 1966 to 1971 (4:5). They found that not only did intent have predictive ability for turnover but the correspondence between intent and behavior increased between the first year and the fourth year of service (4:24). In the first year, 28 percent of the airmen indicating a positive career intent actually reenlisted and 84 percent indicating negative career intent actually separated. Fourth-year career intent responses predicted 62 percent of the reenlistments and 93 percent of the separations (4:10).

Since the end of the draft and the implementation of the all volunteer force concept, there have been several studies to determine the major factors affecting retention and turnover in the military. This review found four studies directly related to Air Force engineering officers and the major factors which can affect their turnover.

In 1978, Captain Logan M. Lewis (19:71) examined "information concerning specific career outcomes that are important in the career decision" of Air Force officers (with 0-5 years active duty) in the scientific and development engineering career fields (26XX and 28XX, respectively). His study (19:54-55) used an expectancy theory model that focused on the importance of 20 career outcomes in making career decisions. Three of these outcomes were related to pay: (1) salary commensurate with performance, (2) salary commensurate with abilities, and (3) earning the highest salary possible. These factors were ranked

ninth, 10th, and 17th, respectively, in importance. The best predictor of career intent was a feeling of achievement; followed by (1) a favorable attitude on the part of the person's immediate family, (2) a 20-year retirement program, (3) relocation every 4 years or less, and (4) earning the highest salary possible.

In 1979, Major Richard J. Mosbach and Captain Thomas J. Scanlan, Jr., identified "the factors that are most closely related to the retention and turnover of AFSC [Air Force Systems Command] company grade officers" (24:5). Their analysis was built upon the model developed by Lewis as discussed above, and included 11 outcomes. Partial results from their study (24:88-89; 142) compares a ranking of the factors (outcomes) for the overall population to both the 28XX and 55XX (civil engineering career field) subpopulations. Only one of the outcomes was related to pay -- earning a high salary. It was ranked ninth by the total sample, as compared to 11th and 7th by the 28XX and 55XX officers, respectively.

In 1980, Captain Kenneth L. Williams performed an analysis of "the responses of 28XX officers to selected questions included in the [1980] Air Force Quality of Life Survey" (31:38). His purpose was to determine "why the retention rates and career intent of engineers were lower than that of other officers" (31:38). Particularly noteworthy, was that when asked to "select the one factor which TODAY would influence you the most NOT to make the Air Force a career" (31:44), 45 percent of the 28XX officers chose pay and allowances compared to only 22 percent of the total sample (including the 28XX officers) (31:44). The promotion system was their next highest response -- 10 percent -- out of the 13 remaining factors (31:44).

In 1982, Captain Michael E. Clayton (USAF) and Major Harold A. Mercer (USMC) "examined the factors influencing career intent decisions among Air Force ... junior officers [with 0-5 years active duty] serving in the civil engineering career field" (7:DD Form 1473). Their study (7:38; 48) focused on 15 motivational factors which would most influence the officers surveyed not to complete a career in the Air Force. The officers ranked the factors, from most to least influence, as follows: (1) policy & administration, (2) salary, (3) personal life, (4) working conditions, (5) work itself, (6) supervision, (7) advancement, (8) status, (9) achievement, (10) recognition, (11) interpersonal relations, (12) education, (13) security, (14) patriotism, and (15) responsibility. Factor analysis and multiple regression were employed to determine which factors best predicted career intent. The strongest predictor of negative career intent was personal life; followed by (1) feeling of achievement, (2) security, and (3) recognition for achievement. The strongest predictors of positive career intent were responsibility and supervision; followed by working conditions, then education.

#### Summary

Although Bluedorn (6) identified four different types of turnover, this study is only concerned with voluntary separations, that is, those individuals who decide to leave a job on their own.

Years of research on turnover and the Mobley et al. conceptual model reveal that the overall turnover process is very complicated and involves many variables. Three variables leading to intentions to search/quit are: (1) satisfaction, (2) attraction-expected utility of the present job, and (3) attraction-expected utility of alternative

jobs. Conceptually, pay dissatisfaction is instrumental in all three of these variables.

According to Lawler (18), assuming that pay is important in satisfying an individual's needs, pay dissatisfaction will result if the individual perceives that the amount of pay that should be received is greater than the amount actually received. Pay dissatisfaction will then lead to job dissatisfaction, which leads to a lower attraction-expected utility of the present job and a higher attraction-expected utility of alternative jobs. Therefore, pay dissatisfaction can ultimately lead to actual turnover behavior.

Intentions to search/quit are the immediate precursor of turnover behavior and a good predictor of actual turnover behavior. Studies on Air Force personnel have found that up to 93 percent of the subjects have acted in accordance with their expressed intentions. In addition, the closer the subject is to performing the actual turnover behavior, the better expressed career intent is as a predictor of that behavior.

Studies on Air Force engineering officers support the assertion that pay does affect career intent, although in varying degrees. Of the four studies presented on major factors affecting career intent, one positively indicated that pay was the most important influence on not making the Air Force a career; another ranked salary as the second most important out of 15 factors; another ranked three salary related outcomes as the ninth, 10th, and 17th most important out of 20 total outcomes; while the last study ranked earning a high salary as the 7th and 11th most closely related factor, out of 11, to the retention and turnover of AFSC 55XX and 28XX company grade officers, respectively.

In conclusion, to study turnover behavior (or retention) of a group

of individuals without actually measuring the behavior over an extended time, using expressed career intent is an accepted method. Also, although pay is not necessarily the best predictor of career intent, it can be a major determinant. The next chapter will present the method used in this study.

### III. Method

#### Introduction

This chapter discusses the method used to answer the investigative questions presented in Chapter I. First, the survey, sample, questionnaire, and pre-test will be explained. Then, data transformations will be discussed. Finally, the techniques used in the statistical analyses will be identified.

#### Data Collection

Survey. This study was accomplished through the administration of a mail survey. This consisted of an eight-page, 68-item questionnaire with a cover letter (Appendix B); a machine-scorable response sheet (AFIT Form 11C); and a pre-addressed return envelope.

Sample. As mentioned in Chapter I, this study was limited to a population consisting of Air Force engineering officers eligible to receive ES CCP. In addition, they had to have either a relevant 28XX AFSC (i.e., 2816; 2825; 2835; 2845; 2855; 2885; and 2895) or a relevant 55XX AFSC (i.e., 5516; 5525A; 5525B; 5525F; and 5525G), and still be on active duty. To assure Investigative Question 4 could be answered by general AFSCs (i.e., 28XX and 55XX), a randomly selected stratified-sample was employed. It consisted of two strata, those with a relevant 28XX AFSC and those with a relevant 55XX AFSC, as indicated above.

There were a number of considerations and constraints which determined the sample size for the study. First, personnel managers for the two career fields (5; 11) indicated that the base-line populations were 5,816 officers in the relevant 28XX stratum, and 1,762 officers in

the relevant 55XX stratum. Furthermore, the AFMPC Personnel Survey Branch (15) limited the survey sample size to 132 officers with a relevant 28XX AFSC, and 120 officers with a relevant 55XX AFSC. These numbers were based on a statistical confidence level of 90 percent using the base-line populations identified above and assuming a 50 percent response rate for the survey.

Based on the base-line populations, a random listing of names was requested from the ATLAS Database (Appendix C). The list was based on academic education code, AFSC, and TAFCSO for each individual. The list was limited by a random selection based on the last digit of each individual's social security number. Three out of ten digits, or a 30 percent random sample, were used for the 28XX population, while five of ten digits, or 50 percent, were requested for the 55XX population. This request generated names for 401 officers with a relevant 28XX AFSC and 118 with a relevant 55XX AFSC. Statistically, it can be assumed that the last digit of each social security number is equally distributed across any individual career field (13). Therefore, the base-line populations were reduced to 1,337 potentially eligible officers with a relevant 28XX AFSC and 236 potentially eligible officers with a relevant 55XX AFSC. Using these revised numbers and the criteria given by AFMPC, the sample size required for a 90 percent confidence level was 129 28XX officers and 106 55XX officers. The survey was actually mailed to 135 28XX officers and 115 55XX officers.

Questionnaire. The questionnaire consisted of six different sections. The first section contained three items of interest about ES CCP. Item 1 was used as a screen question to determine those officers who had been eligible to receive ES CCP. This section was followed by 23

items related to general feelings about work; 3 items concerning general feelings about pay; 19 items concerning general feelings about career decisions; 2 items about intentions to remain; and 18 items for background information. These 68 items requested information potentially relevant to answering the four investigative questions presented in Chapter I. The questionnaire is at Appendix B.

Design. Investigative Question 1 was "How do Air Force engineering officers perceive that ES CCP has affected their past decisions to remain in the Air Force?" The questionnaire was designed to answer this question through the responses to Item 2 which stated "At the time I was offered the 'Engineering Bonus,' it was one of the major reasons I stayed in the Air Force." Item 2 requested a response using a seven-point Likert-like scale ranging from (1) STRONGLY AGREE to (7) STRONGLY DISAGREE.

Investigative Question 2 was "How do Air Force engineering officers perceive that the discontinuance of their receiving ES CCP will affect their future decisions to remain in the Air Force?" The questionnaire was designed to answer this question through the responses to Item 3 which stated "At this time, I feel the discontinuance of the 'Engineering Bonus' is critical in my decision whether or not to stay in the Air Force." Item 3 requested a response using the same agree-disagree scale mentioned above.

Investigative Question 3 was "How do Air Force engineering officers perceive their overall salary influencing their career decisions as compared to other factors?" The questionnaire was designed to answer this question through the responses to Items 30-48 which listed 19 motivational factors believed to influence the career decisions of Air

Force engineering officers. The factors used in Items 31-45 were adapted directly from the Clayton & Mercer (7:22-25) study on civil engineering officers in the Air Force and Navy; while Items 30, 46, and 47 contained factors used in studies on Air Force engineering officers by both Lewis (19:51-55) and Mosbach & Scanlan (24:35-39). In addition, the "Air Force way of life" was included as a factor in Item 48. The questionnaire requested each respondent to rate the influence of these 19 factors on their career decisions using a seven-point Likert-like scale ranging from (1) VERY POSITIVE to (7) VERY NEGATIVE.

Investigative Question 4 was "Do perceptions about pay vary between different groups of Air Force engineering officers by AFSC, academic degree, or military rank?" The questionnaire was designed to answer this question through the responses to pay related item (i.e., Items 2-3, 17-20, 27-29, and 32) after separating the respondents into different groups via Items 53 and 66-68.

Pre-Test. A pre-test of the survey was performed to identify any potential problem areas. It was administered to 10 Air Force engineering officers with either a 28XX or 55XX AFSC who were graduate students at the School of Systems and Logistics, Air Force Institute of Technology (AU).

#### Data Transformation

Once the response sheets (i.e., APIT Form 11C) were returned, they were checked to be sure that they were properly coded. Two response sheets were questionable (because the proper response scales were not used) and were not used. Also, the responses for those respondents indicating they had never been eligible to receive ES CCP (from Item 1 on

the questionnaire) were not used in the analysis. The data from those response sheets that were used in the analysis were machine scored and read into, and stored on, a CDC 6600 computer.

### Statistical Analyses

All techniques employed for the following statistical analyses used the computerized Statistical Package for the Social Sciences, Version 10 (SPSSx) (25). Investigative Questions 1 and 2 were answered by determining both the mean response and the response frequencies for Items 2 and 3, respectively.

To answer Investigative Question 3, the mean response to each factor (i.e., Items 30-48) was first determined. The factors were then ranked, according to their means, from 1 VERY POSITIVE to 7 VERY NEGATIVE to determine how SALARY (i.e., Item 32) was ranked compared to the other 18 factors.

To answer Investigative Question 4, the Pearson correlation coefficients between all pay related items (i.e., Items 2-3, 17-20, 27-29, and 32) were first determined. Those items that were highly correlated were then grouped to form pay related factors; to be used for comparisons between the different groups of Air Force engineering officers. The respondents were then separated into different groups by AFSC (via Items 66 and 67), academic degree (via Item 68), and military rank (via Item 53). Finally, within the major grouping (i.e., AFSC, academic degree, and military rank), the subgroups were then tested to determine if there were any differences in their responses to the pay factors by means of a one-way analysis of variance (ANOVA).

#### IV. Results

##### Introduction

This chapter presents the results of the statistical analyses performed, as presented in Chapter III, along with supplemental statistical analyses where deemed necessary. The results are presented for each investigative question, starting with Question 1.

Of the 250 surveys that were sent out, 165 were returned for a response rate of 66 percent. 120 of the 165 returned were used for the statistical analyses presented providing a usable return rate of 48 percent. Therefore, the results presented are slightly below the 90 percent confidence level with a + 10 percent confidence interval as presented in Chapter III. The 45 returned-surveys that were not used consisted of 2 with unscorable responses and 43 officers indicating they were never eligible to receive ES CCP. This means that the reduced base-line population presented in Chapter III was very conservative, thus indicating that the actual confidence level was greater than the slightly below 90 percent indicated above. In addition, in 15 of the 120 surveys used, the officers indicated that they had never accepted ES CCP. Because these 15 officers were not required to answer Item 2 on the questionnaire, whenever Item 2 was involved with a particular statistical analysis, the sample was reduced to 105. The questionnaire responses used are at Appendix D.

##### Investigative Question 1

Investigative Question 1 was "How do Air Force engineering officers perceive that ES CCP has affected their past decisions to remain in the

Air Force?" This question was answered through the responses to Item 2 on the questionnaire that stated "At the time I was offered the 'Engineering Bonus,' it was one of the major reasons I stayed in the Air Force." Item 2 had a mean response of 3.84 and the response frequency illustrated in Figure 6. Supplemental statistical analyses were performed in an attempt to determine why the histogram in Figure 6 does not resemble the expected bell-shaped curve.

For the supplemental statistical analyses, the respondents were divided into two groups based on an inspection of Figure 6. The two groups were: (1) the AGREE group -- those officers whose response to Item 2 was either 1 or 2 -- and (2) the DISAGREE group -- those officers whose response to Item 2 was either 6 or 7. The survey data was then examined to provide insight into other attitudinal or demographic data that characterized these two groups. For interval data, Pearson correlation coefficients were calculated. Thus Item 2 was correlated with Items 4-50. For nominal data, chi-square tests of independence were used. Thus Item 2 was examined in this manner through crosstabulations with Items 51-68. The most important findings from the correlation coefficients were the correlation of Item 2 and Item 49, short-term career intent,  $r=.28$ ,  $p=.004$ , and also Item 2 and Item 50, long-term career intent,  $r=.34$ ,  $p=.001$ . The most important finding from the chi-square analyses concerned commissioned service and is shown in Table 1. The agree and disagree groups were statistically independent,  $\chi^2=12.12$ ,  $p=.002$ . The impact of commissioned service was also apparent thru both age and rank,  $\chi^2=12.92$  and  $8.07$ ,  $p=.002$  and  $.018$ , respectively. Using Item 2 as the independent variable, Items 49-51, 53, and 65 were then examined using one-way ANOVA.

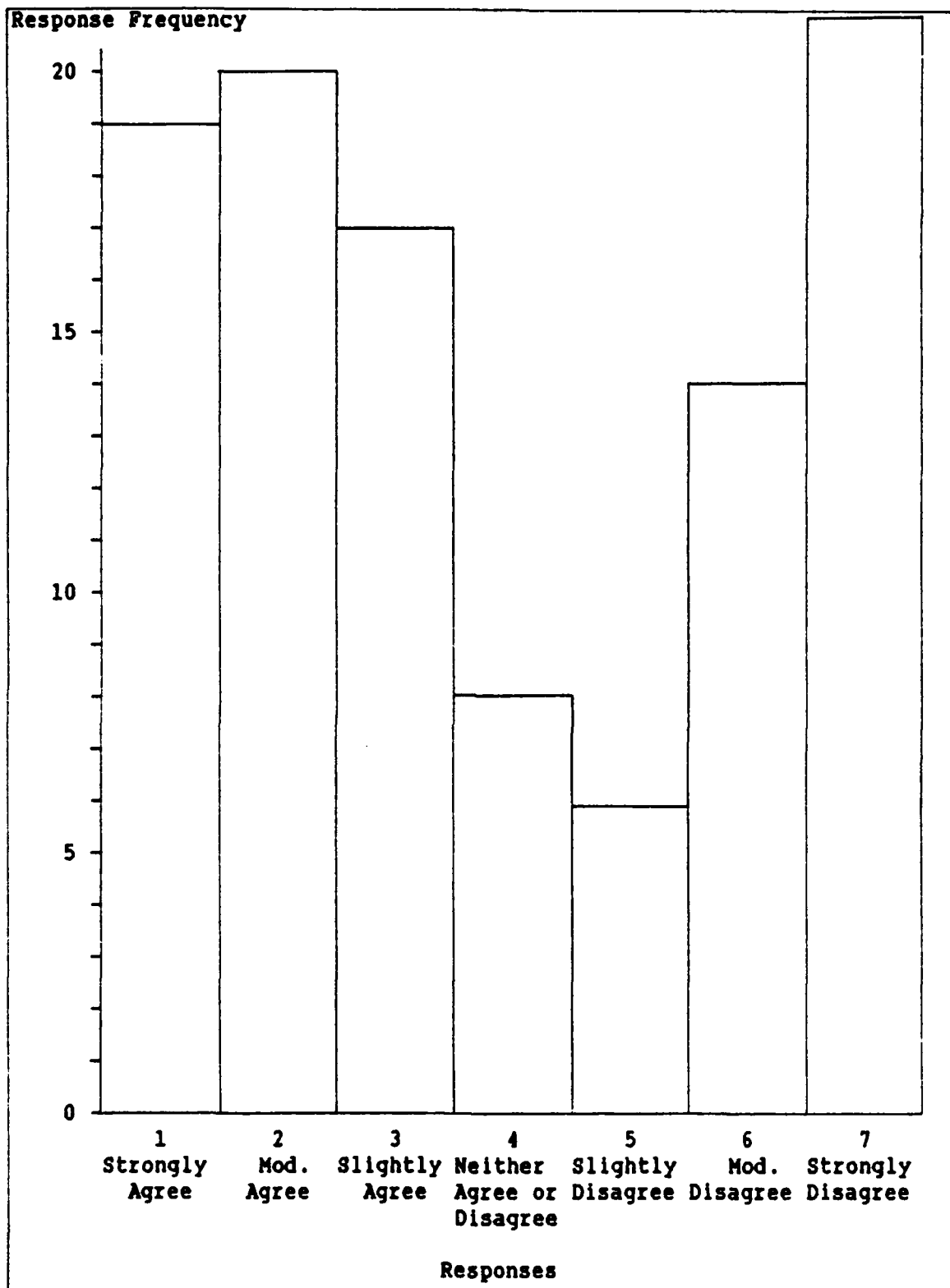


Figure 6. Histogram of Responses to Item 2, "At the time I was offered the 'Engineering Bonus,' it was one of the major reasons I stayed in the Air Force."

Table 1

Crosstabulation of Item 65 and Those Officers  
That Definitely Agree or Disagree With Item 2

Commissioned Service	Agree (n=39)	Disagree (n=35)
4-7	59.0% (n=23)	29.4% (n=10)
8-11	35.9% (n=14)	38.2% (n=13)
12-19	5.1% (n=2)	34.3% (n=12)

Table 2

Results of One-Way ANOVA on  
Items 49, 50, and 65 by Item 2

Item	Group Mean Response		F Ratio	F Prob.
	Agree (n=39)	Disagree (n=35)		
49	3.15	1.83	10.41	.002
50	3.18	1.69	16.91	.001
65	2.46	3.06	13.24	.001

Significant results from these analyses are shown in Table 2.

### Investigative Question 2

Investigative Question 2 was "How do Air Force engineering officers perceive that the discontinuance of their receiving BS CCP will affect their future decisions to remain in the Air force?" This question was answered through the responses to Item 3 on the questionnaire that stated "At this time, I feel the discontinuance of the 'Engineering

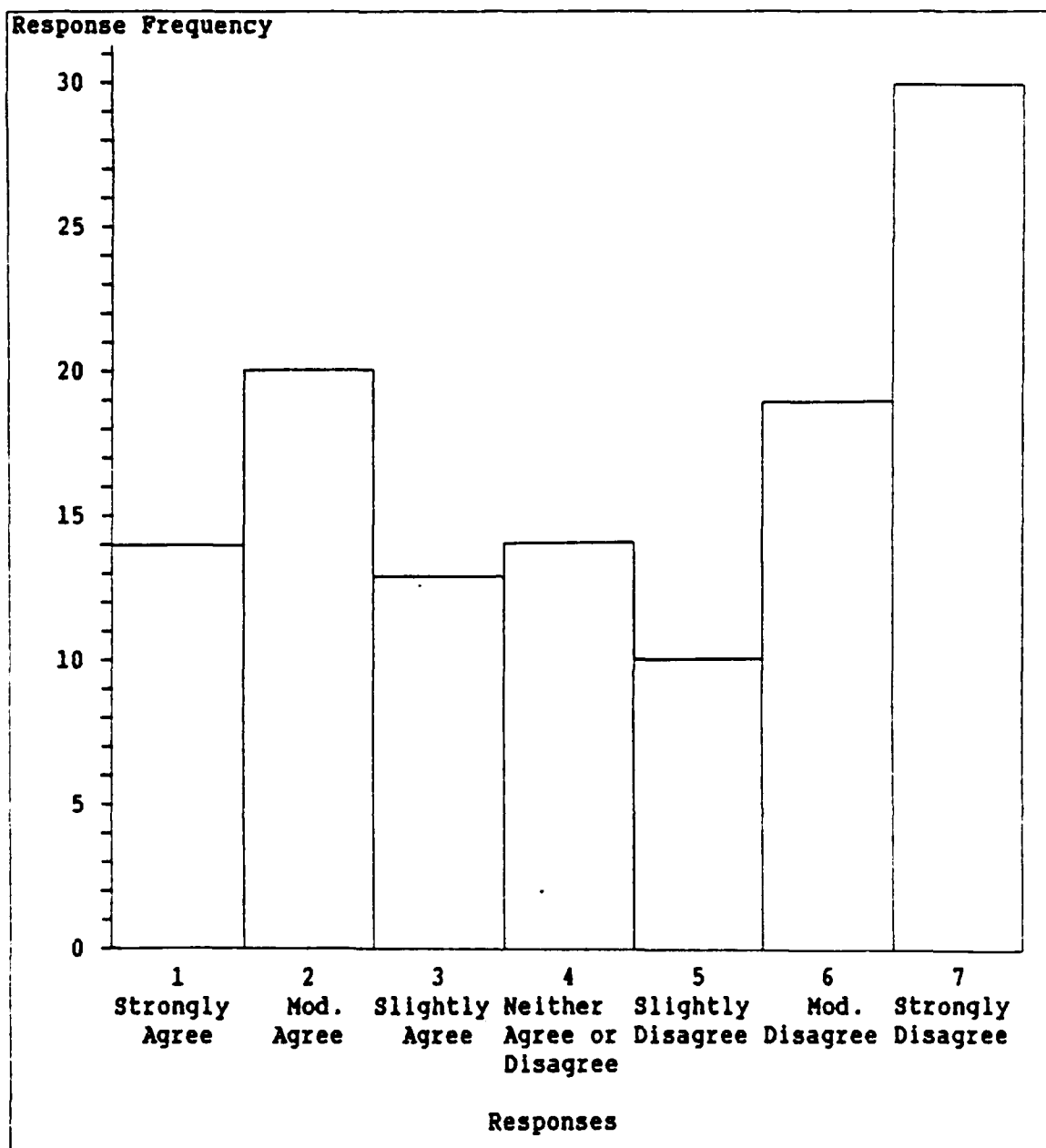


Figure 7. Histogram of Responses to Item 3, "At this time, I feel the discontinuance of the 'Engineering Bonus' is critical in my decision whether or not to stay in the Air Force."

Bonus' is critical in my decision whether or not to stay in the Air Force." Item 3 had a mean response of 4.36 and the response frequency illustrated in Figure 7. Supplemental statistical analyses were performed in an attempt to determine why the histogram in Figure 7 does

Table 3

Crosstabulation of Item 65 and Those Officers  
That Definitely Agree or Disagree With Item 3

Commissioned Service	Agree (n=34)	Disagree (n=49)
4-7	79.4% (n=27)	34.7% (n=17)
8-11	20.6% (n=7)	32.7% (n=16)
12-19	0.00% (n=0)	32.7% (n=16)

not resemble the expected bell-shaped curve.

For the supplemental statistical analyses, the respondents were divided into two groups based on an inspection of Figure 7. The two groups were: (1) the AGREE group -- those officers whose response to Item 3 was either 1 or 2 -- and (2) the DISAGREE group -- those officers whose response to Item 3 was either 6 or 7. The survey data was then examined to provide insight into other attitudinal or demographic data that characterized these two groups. For interval data, Pearson correlation coefficients were calculated. Thus Item 3 was correlated with Items 4-50. For nominal data, chi-square tests of independence were used. Thus Item 3 was examined in this manner through crosstabulations with Items 51-68. The most important findings from the correlation coefficients were the correlation of Item 3 and Item 49, short-term career intent,  $r=.47$ ,  $p=.001$ , and also Item 3 and Item 50, long-term career intent,  $r=.56$ ,  $p=.001$ . The most important finding from the chi-square analyses concerned commissioned service and is shown in Table 3. The agree and disagree groups were statistically independent,

Table 4

Results of One-Way ANOVA on  
Items 49, 50, and 65 by Item 3

Item	Group Mean Response		F Ratio	F Prob.
	Agree (n=34)	Disagree (n=49)		
49	4.09	1.84	37.56	.001
50	4.38	1.76	61.97	.001
65	2.21	3.00	24.67	.001

chi-square=19.73,  $p=.001$ . The impact of commissioned service was also apparent thru both age and rank, chi-square=13.21 and 19.65,  $p=.001$  and .001, respectively. Using Item 3 as the independent variable, Items 49-51, 53, and 65 were then examined using one-way ANOVA. Significant results from these analyses are shown in Table 4.

### Investigative Question 3

Investigative Question 3 was "How do Air Force engineering officers perceive their overall salary influencing their career decisions as compared to other factors?" This question was answered by ranking the responses to Items 30-48 on the questionnaire, which contained 19 motivational factors. Out of the 19 motivational factors examined, respondents ranked SALARY the 17th most influential in their career decisions with a mean response of 3.62. Supplemental statistical analyses were performed to determine if SALARY was ranked differently by those respondents who believed ESCCP was critical in their decision whether or not to stay in the Air Force, and those that did not.

For the supplemental analyses the respondents were divided into two

groups: (1) the AGREE group -- those officers whose response to Item 3 was from 1-3 -- and (2) the DISAGREE group -- those officers whose response to Item 3 was from 5-7. Both of these groups also ranked SALARY the 17th most influential factor in their career decisions out of the 19 examined, with mean responses of 3.92 and 3.34, respectively. The top ten factors influencing the career decisions for all three groups are listed in Table 5.

#### Investigative Question 4

Investigative Question 4 was "Do perceptions about pay vary between different groups of Air Force engineering officers by AFSC, academic degree, or military rank?" This question was answered through the comparison of responses to Item 53 (current rank), Items 66 and 67 (AFSCs), and Item 68 (academic degree) to the mean responses of specific pay factors.

After calculating the Pearson correlation coefficients between all pay related items on the questionnaire (i.e., Items 2, 3, 17-20, 27-29, and 32), it was determined that two pay related factors would be used. The first, a ES CCP factor, consisted of Items 2, 3, and 18; while the second, a pay comparison factor, consisted of Items 19 and 27-29. A reliability analysis resulted in alpha values of 0.726 and 0.757 for the ES CCP and pay comparison factors, respectively, which are considered good (29).

The responses to Item 53 allowed three groups to be compared against the two pay factors. The three groups were (1) junior captains (those with less than eight years commissioned service), (2) senior captains (those with eight or more years commissioned service), and (3)

Table 5

**The Top Ten Factors Influencing the Career  
Decisions of Air Force Engineering Officers**

Rank	Motivational Factor (with Mean Response) by Group		
	Overall (n=120)	Agree (n=47)	Disagree (n=59)
1	Retirement Benefits (1.88)	Retirement Benefits (2.15)	Retirement Benefits (1.70)
2	Responsibility (2.12)	Responsibility (2.21)	Achievement (1.97)
3	Achievement (2.21)	Education & Skills (2.38)	Responsibility (1.98)
4	Education & Skills (2.37)	Advancement (2.43)	Work Itself (2.32)
5	Work Itself (2.48)	Patriotism (2.66)	Security (2.41)
6	Security (2.56)	Work Itself (2.70)	Education & Skills (2.42)
7	Patriotism (2.58)	Security (2.72)	Patriotism (2.61)
8	Interpersonal Relations (2.76)	Interpersonal Relations (2.81)	Advancement (2.70)
9	Family (2.79)	Family (2.83)	Interpersonal Relations (2.73)
10	Advancement (2.80)	Advancement (2.92)	Family (2.93)

majors. For the ES CCP factor, the Sceffe multiple range test indicated that the mean response for junior and senior captains, 9.28 and 12.96, respectively, were significantly different at the .05 level.

The responses to Items 66 and 67 allowed only two groups to be

compared against the two pay factors. The two groups were (1) the 55XX career field and (2) the 28XX career field. For the ES CCP factor, an F statistic of 1.53 was calculated with an observed significance level of .218. This indicates that the means for the 55XX and 28XX career fields, 10.23 and 11.40, respectively, were not significantly different. For the pay comparison factor, an F statistic of 12.21 was calculated, with an observed significance level of .001. This indicates that the mean response for the 55XX and 28XX career fields, 18.25 and 19.94, respectively, were significantly different.

The responses to Item 68 allowed four groups to be compared against the two pay factors. The four groups were (1) aeronautical engineering, (2) architecture, (3) electrical engineering, and (4) mechanical engineering. Due to limited responses, architectural engineering was grouped with architecture, and astronautical engineering was excluded altogether. For the ES CCP factor, the Scheffe multiple range test indicated that no two groups were significantly different at the .05 level. For the pay comparison factor, the Scheffe multiple range test indicated that the mean response for architecture, 17.00, was significantly different at the .05 level from the means for both electrical and mechanical engineering, 19.24 and 19.67, respectively.

## V. Discussion

### Introduction

This chapter discusses how Air Force engineering officers perceive ES CCP and pay, in general, affects their career decisions. It addresses the literature reviewed in Chapter II and the results presented in Chapter IV in answering the four investigative questions. Finally, after a discussion of the study limitations, recommendations are offered.

### The Perceived Effect of ES CCP on Past Career Decisions

Survey results showed that 37 percent of the officers surveyed believed that ES CCP was definitely important in their past career decisions whereas 33 percent believed that it definitely was not. This strongly bimodal distribution of responses suggested that there are strong differences among Air Force engineering officers as to the importance of ES CCP in career decisions. Subsequent analyses indicated that both tenure and career intent were associated with these strong opinions. The data suggested that officers believing that ES CCP was definitely important in their past career decisions were young officers, typically captains with less than eight years of commissioned service. These individuals indicated that they were only leaning toward making the Air Force a career. On the other hand, the data suggested that officers believing ES CCP definitely was not important in their past career decisions were older officers, captains with eight or more years of commissioned service. These individuals indicated that they would probably be making the Air Force a career. Bear in mind that both

groups were offered ES CCP.

These results seem reasonable. One might expect that individuals with less time invested in an organization and/or having weaker intentions of remaining with an organization, to be more likely to let their career decisions be influenced by money. In addition, research reported by Mobley et al., among others, has shown that tenure and intentions to remain have a consistently positive association with retention (23:514-515).

#### The Perceived Effect of ES CCP Discontinuance on Future Career Decisions

Survey results showed that 28 percent of the officers surveyed believed that ES CCP discontinuance would definitely be important to their future career decisions whereas 41 percent believed that it definitely would not. Statistical results indicated that tenure, career intent, and age were associated with these strong opinions and are useful in understanding the strong differences of opinion exhibited. The data indicated that officers believing ES CCP discontinuance definitely was important in their future career decisions were captains with less than eight years of commissioned service, and were currently 26-30 years old. These individuals indicated that they were undecided about making the Air Force a career. On the other hand, officers believing ES CCP discontinuance definitely was not important in their future career decisions were captains with eight or more years of commissioned service, and were currently 31-35 years old. These individuals indicated that they would probably be making the Air Force a career.

As mentioned in the previous section, the results for tenure and

career intent seem logical. The results for age also seem reasonable. One would expect younger individuals to be less predictable (i.e., willing to quit a job and start over) and to have fewer responsibilities (e.g., dependents), and therefore, more easily influenced by money. A consistently positive association between age and retention has also been reported by Mobley et al., among others (23:514). However, keep in mind that the confidence level was only approximately 90 percent.

#### Factors Perceived to Influence Career Decisions

Air Force engineering officers surveyed ranked salary as the 17th most influential factor in their career decisions out of the 19 motivational factors examined. The mean response of 3.62 indicates that salary was viewed as basically neutral. It is interesting to note that after separating the officers into two groups, those that agreed with Item 3 and those that disagreed with Item 3, both groups still only ranked salary as the 17th most influential factor on career decisions by both groups. That is, even though ES CCP discontinuance was believed to be important in the future career decisions for the agree group, they did not view salary to be any more important in their career decisions. This suggests that ES CCP may be perceived as an important factor when it is singled out as a special bonus but loses its impact if just part of an overall pay package.

The low ranking of salary suggests that it would be a dissatisfier using Lawler's model. Lawler's model would suggest that salary is only useful in retaining Air Force engineering officers when the individual is currently dissatisfied with his or her salary. This is not surprising since results obtained by the Air Force Manpower & Personnel

Center (AFMPC) indicate that pay has consistently been shown to be a dissatisfier in the Air Force over recent years for both officers and enlisted personnel (1).

The Air Force engineering officers surveyed ranked retirement benefits as the most influential factor in their career decisions, followed by numerous factors related to the job itself. This corresponds to results presented by the AFMPC on factors consistently shown to be the top satisfiers for Air Force officers over recent years.

The low ranking of salary in this study corresponds with the low ranking of salary in both the Lewis and Mosbach & Scanlan studies reviewed in Chapter II, but is contrary to the high ranking of both the Williams and Clayton & Mercer studies presented. One explanation may be that those studies that rank salary low, approach the subject in a positive fashion (i.e., salary is related to retention), while those studies that rank salary high, approach the subject in a negative fashion (i.e., salary is related to turnover).

#### Group Differences on Perceptions of Pay

With regard to different ranks, statistical results indicated that Air Force engineering officers considered to be junior captains, compared to those officers considered to be senior captains, believed that ES CCP was more important to their overall career decisions; no differences of opinion were statistically evident between majors and either junior or senior captains. The differences of opinion between junior and senior captains are in agreement with the results obtained to answer Investigative Questions 1 and 2, concerning tenure. The reason no statistical differences of opinion were found between majors and

either junior or senior captains may be because of the relatively small number of officers in the major group surveyed. Statistically, Air Force engineering officers with the rank of junior captain, senior captain, and major had no differences of opinion regarding the comparison of pay between Air Force engineering officers and civilian engineers. All three groups viewed civilian engineers as being paid more.

With regard to different AFSCs, statistical results indicated that Air Force engineering officers with AFSCs of 28XX and 55XX had no differences of opinion on the importance of ES CCP to their overall career decisions. This is in agreement with the results obtained to answer Investigative Questions 1 and 2 where tenure, career intent, and age were the only variables found to be associated with opinions on ES CCP with regard to career decisions. Statistically, Air Force engineering officers with a 28XX AFSC, compared to those with a 55XX AFSC, believed there was a larger pay difference between Air Force engineering officers and civilian engineers. Both groups viewed civilian engineers as being paid more. Air Force engineering officers are all paid the same basic pay and allowances, regardless of AFSC, while civilian engineers with jobs comparable to those performed by officers with a 28XX AFSC tend to be paid more than civilian engineers with jobs comparable to those performed by officers with a 55XX AFSC.

With regard to different academic degrees, statistical results indicated that Air Force engineering officers with academic degrees of aeronautical engineering, architecture, electrical engineering, and mechanical engineering had no differences of opinion on the importance of ES CCP to their overall career decisions. This is in agreement with

the results obtained to answer Investigative Questions 1 and 2 where tenure, career intent, and age were the only variables found to be associated with opinions on ESCCP with regard to career decisions. Statistically, Air Force engineering officers with a architecture degree, compared to both those with either an electrical or a mechanical engineering degree, believed there was a smaller pay difference between Air Force engineering officers and civilian engineers. All groups viewed civilian engineers as being paid more than Air Force engineering officers. The reason no statistical difference of opinion was found between architecture/architectural engineering and aeronautical engineering may be because of the small number of officers in both groups.

### Conclusions

Air Force engineering officers responding to the survey expressed strong opinions (i.e., they definitely agreed or disagreed) about the importance of ESCCP on their career decisions. Surprisingly, those officers agreeing that ESCCP discontinuance was important to their future career decisions did not consider salary in general to have a more significant influence on their career decisions than those officers disagreeing. Significant findings are summarized as follows:

1. In general, Air Force engineering officers perceived ESCCP to be important in their career decisions if:

- a. They were not really sure about their intent to make the Air Force a career
- b. They had less than eight years of commissioned service
- c. They were less than 31 years old

2. In general, Air Force engineering officers perceived ES CCP to not be important in their career decisions if:

- a. They were already fairly certain about their intent to make the Air Force a career
- b. They had eight or more years of commissioned service
- c. They were 31 or more years old

3. In general, Air Force engineering officers perceived salary as not being a major factor in career decisions. Out of 19 motivational factors examined, salary was perceived to be the 17th most influential in career decisions.

4. In general, Air Force engineering officers perceived their military pay to be less than the pay received by civilian engineers.

- a. Officers with a 28XX AFSC perceived the pay comparison to be worse than those officers with a 55XX AFSC.
- b. Both those officers with either an electrical or a mechanical engineering degree perceived the pay comparison to be worse than those officers with an architecture degree.

#### Limitations

To interpret and/or apply the results of any type of research effort, it is important to understand the limitations of the data used. This study was based on the self-reported perceptions (Appendix D) provided by individual Air Force engineering officers responding to the mail survey at Appendix B.

The small survey response size of 120 resulted in approximately a 90 percent confidence level with a + 10 percent confidence interval. In addition, a response rate of only 48 percent raises questions regarding

bias in the results due to the potential of nonrandom responses.

The survey sample was selected randomly using the ATLAS database according to specific criteria (Appendix C). This criteria limits the direct application of the survey results to those active duty Air Force engineering officers who were eligible to receive ES CCP from 1 October 1982 through 30 September 1985 with both a relevant academic degree and a relevant 28XX or 55XX AFSC. Caution should be used when extrapolating these results to other AFSCs, academic degrees, or time-periods.

### Recommendations

Based on the results of this study, it can be seen that ES CCP can be an effective, but not necessarily efficient means of improving the retention of some Air Force engineering officers. To improve the efficiency in the future, the percentage of officers receiving ES CCP and believing that ES CCP is not important in their career decisions needs to be reduced. The survey results indicate that one way this can be accomplished is by adjusting the current ES CCP eligibility requirements for both rank and TAFCS. For the Air Force engineering officers in this study that would amount to reducing the maximum eligible rank from colonel to captain, and the maximum eligible TAFCS from 12 to 7 years.

Since career intent was the best means of determining whether or not an officer definitely felt ES CCP was important to his or her career decisions in this study, supplemental studies need to be done in this area. The studies should concentrate on determining the best predictors of career intent for Air Force engineering officers. It appeared from this study that career intent was associated with TAFCS, as would be expected. It should be determined at just what point in their careers

Air Force engineering officers make that commitment. Once this is determined, the TAFCS eligibility requirement for receiving ES CCP might be adjusted further.

Although pay in general was found not to be a major factor in career decisions for those officers in this study, this does not mean pay is not important, especially for younger officers who are still becoming institutionalized to the Air Force. The Air Force engineering community should look at AFMPC Quality of Life survey results for engineers using the data bases obtained by AFMPC. Ongoing analyses would keep Air Force engineers atune to changes in attitude toward pay in a more real-time manner.

Finally, to understand the full impact of ES CCP on the career decisions of Air Force engineering officers, additional studies need to be completed on the following populations: (1) those active duty officers eligible for ES CCP in the past but not included in this study, (2) those active duty officers with AFSCs eligible for ES CCP in the past but not having an eligible academic degree, (3) those active duty officers with academic degrees eligible for ES CCP in the past but not having an eligible AFSC, (4) those active duty officers anticipating eligibility for ES CCP but having it discontinued before meeting the minimum TAFCS requirement, and (5) those officers that have seperated from the Air Force but fall into one of the groups mentioned above.

This study suggests that the use of Engineering and Scientific Career Continuation Pay (ES CCP) is a valid means of influencing the career decisions of Air Force engineering officers. The problem is being able to identify the specific officers who will be influenced by ES CCP at a specific time so that it can be targeted more effciently.

## Appendix A

### ESCCP Eligibility Criteria

(The following is an excerpt from AFR 36-1, Special Pay: Engineering and Scientific Career Continuation Pay (ESCCP). (8:2-3))

To be eligible for ESCCP, an Air Force officer must:

- a. Be on active duty.
- b. Be entitled to basic pay.
- c. Not be receiving any other accession or career continuation bonus.
- d. Be below the rank of colonel.
- e. Have completed 4 years and will have no more than 12 years of total active federal commissioned service (TAFCS) as of the termination of the agreement.
- f. Have the technical qualifications to perform in engineering or scientific duties.
- g. Have completed at least 3 years of engineering or scientific duty. (Air Force Institute of Technology (AFIT) undergraduate engineering time does not qualify towards the 3 years of job experience requirement.)
- h. Possess a degree in engineering or science from an accredited college or university that qualifies the officer for engineering or scientific duties based on the AFSC. (An annual review will determine the eligible academic specialty codes. The Air Force Manpower and Personnel Center (AFMPC) will forward this list to the MAJCOMs and consolidated base personnel offices (CBPOs) as appropriate.)
- i. Be serving in, or selected for, an assignment to (within 1 year from BED) a current critical shortage engineering or scientific duty position. (An annual review will determine the eligible AFSCs. AFMPC will forward this list to the MAJCOMs and CBPOs as appropriate.)
- j. Execute a written agreement to remain on active duty for detail to engineering or scientific duty for a time period corresponding to the length of the agreement.
- k. Not be a pilot or navigator on active flying status, or receiving aviation career incentive pay (ACIP).
- l. Not have an established date of separation (DOS) before the expiration of the ESCCP agreement. An established DOS before the end of the ESCCP agreement period must be withdrawn before the effective date of the ESCCP agreement.
- m. Be continued on active duty to remain eligible for the ESCCP if an engineering and scientific (E&S) officer, Regular or Reserve, twice fails promotion to the next higher grade.
- n. Hold a fully qualified AFSC that requires an engineering or scientific degree.

## Appendix B

### Survey on Engineering Officer Career Decisions



DEPARTMENT OF THE AIR FORCE  
AIR FORCE INSTITUTE OF TECHNOLOGY (AFIT)  
WRIGHT-PATTERSON AIR FORCE BASE, OH 45433-6583

1 JUN 1986

REPLY TO  
ATTN OF LSG

SUBJECT Survey on Engineering Officer Career Decisions

TO Air Force Engineering Officers

1. Currently, there is a desire within the Air Force to understand how engineering officers make career decisions. To accomplish this, we are interested in your perceptions on numerous factors which may affect the way you make these decisions. This study will be of value to the Air Force in evaluating personnel issues involving the engineering community.

2. Your participation is voluntary, and your responses will be anonymous. Please do not fill in any of the information at the top of the response form (AFIT Form 11C). Results will be presented only in terms of group averages describing what the "typical" engineering officer would say. When the results of the survey are published, readers will in no way be able to identify specific individuals.

3. Please complete the survey and return it to AFIT/LSG in the enclosed envelope within ten working days. If you have any questions, contact Capt Douglas C. Miller at AUTOVON 795-4437. Thank you for your cooperation and participation.

A handwritten signature in cursive script, reading "Larry L. Smith", is positioned above the typed name.

LARRY L. SMITH, Colonel, USAF  
Dean  
School of Systems and Logistics

3 Atch  
1. Survey  
2. AFIT Form 11C  
3. Return Envelope

SURVEY ON  
ENGINEERING OFFICER  
CAREER DECISIONS

Instructions

Answer all items by filling in the appropriate spaces on the machine scored response form (AFIT Form 11C) provided. Select only one response for each item and clearly erase any responses you change. If for any item you do not find a response that fits your situation exactly, use the one that is closest to the way you feel. Please answer each item as honestly and frankly as possible.

To ensure your response remains anonymous, do not fill in any of the information at the top of the form.

Engineering and Scientific Career Continuation Pay

1. What has been your experience with respect to the "Engineering Bonus"?

- (1) I am currently receiving it
- (2) I am not currently receiving it, but have received it in the past
- (3) I have never received it, but have been eligible to receive it.  
(If this is your response, please skip item 2 and go directly to item 3.)
- (4) I have never received nor been eligible to receive it. (If this is your response, please go directly to item 65.)

USE THE FOLLOWING RESPONSE SCALE FOR ITEMS 2 THRU 21:

(1)	(2)	(3)	(4)	(5)	(6)	(7)
STRONGLY AGREE	MODERATELY AGREE	SLIGHTLY AGREE	NEITHER AGREE OR DISAGREE	SLIGHTLY DISAGREE	MODERATELY DISAGREE	STRONGLY DISAGREE

2. At the time I was offered the "Engineering Bonus," it was one of the major reasons I stayed in the Air Force. (Please try to recall your thoughts at the time you were making this decision.)

3. At this time, I feel the discontinuance of the "Engineering Bonus" is critical in my decision whether or not to stay in the Air Force.

General Feelings About Work

(1)	(2)	(3)	(4)	(5)	(6)	(7)
STRONGLY AGREE	MODERATELY AGREE	SLIGHTLY AGREE	NEITHER AGREE OR DISAGREE	SLIGHTLY DISAGREE	MODERATELY DISAGREE	STRONGLY DISAGREE

4. The most important things that happen to me involve my work.
5. The most important things I do involve my work.
6. The major satisfaction in my life comes from my job.
7. The activities which give me the greatest pleasure and personal satisfaction involve my job.
8. I live, eat, and breathe my job.
9. I would rather get a job promotion than be a more important member of my club, church, or lodge.
10. How well I perform on my job is extremely important to me.
11. I feel bad if I do not perform well in my job.
12. I am very personally involved in my work.
13. I avoid taking on extra duties and responsibilities.
14. I view my present job as being one of importance in the defense of my nation.
15. I consider my job and association with the Armed Forces as being a patriotic duty.
16. I feel the military is an environment in which I can attain my personal goals.
17. I feel that my pay is appropriate for the position I hold.
18. I believe that an "Engineering Bonus" is necessary in order to make my military pay comparable with that of my contemporaries outside the military.
19. I believe my chances of finding a comparable job (i.e., within my career field), with equal pay or better, outside the military are outstanding.
20. I believe my chances of finding an acceptable alternative to my current job (i.e., in another career field), with equal or better pay, outside the military are outstanding.
21. I believe my Air Force jobs have been an accurate representation of what I expected before entering active duty?

USE THE FOLLOWING RESPONSES FOR ITEMS 22 THRU 26:

- (1) DELIGHTED
- (2) PLEASED
- (3) MOSTLY SATISFIED
- (4) MIXED (about equally satisfied and dissatisfied)
- (5) MOSTLY DISSATISFIED
- (6) UNHAPPY
- (7) TERRIBLE

22. How do you feel about your job?

23. How do you feel about the people you work with -- your co-workers?

24. How do you feel about the work you do on your job -- the work itself?

25. How do you feel about what it is like where you work -- the physical surroundings, the hours, the amount of work you are asked to do?

26. How do you feel about what you have available for doing your job -- the equipment, the information, your supervisors, and so on?

#### General Feelings About Pay

QUESTIONS 27 THRU 29 ASK YOU TO COMPARE YOUR CURRENT MILITARY PAY (INCLUDING ALL ALLOWANCES AND OTHER ENTITLEMENTS, EXCEPT ANY "ENGINEERING BONUS" YOU MAY BE RECEIVING) WITH THE PAY OF A CIVILIAN'S IN A SIMILAR CAREER FIELD, BASED ON SEVERAL VARIABLES. USE THE FOLLOWING RESPONSES TO ANSWER THESE QUESTIONS:

- (1) Military pay is FAR HIGHER than civilian
- (2) Military pay is SOMEWHAT HIGHER than civilian
- (3) Both are EQUAL
- (4) Military pay is SOMEWHAT LESS than civilian
- (5) Military pay is FAR LESS than civilian

27. How do you think your military pay compares to your civilian contemporaries?

28. How do you think your military pay compares to a civilian's with the same amount of responsibility?

29. How do you think your military pay compares to a civilian's with the same degree of experience (including education)?

General Feelings About Career Decisions

USE THE FOLLOWING RESPONSE SCALE TO EXPRESS HOW EACH OF THE FACTORS LISTED IN ITEMS 30 THRU 48 INFLUENCE YOUR CAREER DECISIONS:

(1)	(2)	(3)	(4)	(5)	(6)	(7)
VERY POSITIVE	MODERATELY POSITIVE	SLIGHTLY POSITIVE	NOT SURE/ UNDECIDED	SLIGHTLY NEGATIVE	MODERATELY NEGATIVE	VERY NEGATIVE

- 30. Retirement benefits
- 31. Feeling of achievement
- 32. Salary
- 33. Work itself
- 34. Policy and administration
- 35. Responsibility
- 36. Supervisor
- 37. Opportunity for advancement
- 38. Interpersonal relations
- 39. Opportunity to further my education and skills
- 40. Personal life and affairs
- 41. Recognition for achievement
- 42. Status
- 43. A sense of patriotism
- 44. Working conditions
- 45. Security
- 46. Family
- 47. Geographic stability
- 48. Air Force way of life

### Intentions to Remain

49. At this time, what is your intention toward staying in the Air Force in the "near" future? Assume that you are able to separate at any time.

- (1) Definitely intend to stay in
- (2) Probably will stay in
- (3) Leaning toward staying in
- (4) Not sure/undecided
- (5) Leaning toward getting out
- (6) Probably will get out
- (7) Definitely intend to get out

50. At this time, what is your intention toward making the Air Force at least a 20-year career?

- (1) Definitely intend to make the Air Force a career
- (2) Probably will make the Air Force a career
- (3) Leaning toward making the Air Force a career
- (4) Not sure/undecided
- (5) Leaning toward not making the Air Force a career
- (6) Probably will not make the Air Force a career
- (7) Definitely will not make the Air Force a career

### Background Information

51. What was your age on your last birthday?

- (1) 20 to 25
- (2) 26 to 30
- (3) 31 to 35
- (4) 36 to 40
- (5) 41 to 45
- (6) 46 to 50
- (7) 51 or more

52. What was your age when you entered the Air Force (if you have had a break in service, use the most recent)?

- (1) 18 to 25
- (2) 26 to 30
- (3) 31 to 35
- (4) 36 or more

53. What is your current rank?

- (1) Second Lieutenant
- (2) First Lieutenant
- (3) Captain (less than eight years of commissioned service)
- (4) Captain (eight or more years of commissioned service)
- (5) Major
- (6) Lieutenant Colonel

54. How many full years of total military enlisted active duty service do you have?

- (1) 0 to 3
- (2) 4 to 7
- (3) 8 to 11
- (4) 12 to 15
- (5) 16 to 19
- (6) 20 or more

55. What is your present marital status?

- (1) Married
- (2) Single

56. How many dependents (including spouse) live with you?

- (1) Zero
- (2) One
- (3) Two
- (4) Three
- (5) Four
- (6) Five
- (7) Six or more

57. How many dependents not living with you do you help support financially (e.g., children in college, children by previous marriage)?

- (1) Zero
- (2) One
- (3) Two
- (4) Three
- (5) Four
- (6) Five
- (7) Six or more

58. What was your source of commission?

- (1) Officer Training School (OTS)
- (2) Reserve Officer Training Corps (ROTC)
- (3) United States Air Force Academy (USAF)
- (4) Other (please specify) \_\_\_\_\_

59. Do you have a Regular Commission?

- (1) Yes
- (2) I was offered one but did not accept it
- (3) No; but I would accept if offered
- (4) No; but not sure I would accept if offered
- (5) No; but I would not accept if offered

60. What is your sex?

- (1) Female
- (2) Male

61. What is the age of your youngest child?

- (1) Not applicable
- (2) Less than one
- (3) 1 to 2
- (4) 3 to 4
- (5) 5 to 11
- (6) 12 to 13
- (7) 14 to 17
- (8) 18 or more

62. What is the highest academic degree you have obtained?

- (1) Bachelor's
- (2) Master's
- (3) Doctoral
- (4) Other (please specify) \_\_\_\_\_

63. What command are you currently assigned to?

- (1) Alaskan Air Command (AAC)
- (2) Air Force Logistics Command (AFLC)
- (3) Air Force Systems Command (AFSC)
- (4) Military Airlift Command (MAC)
- (5) Pacific Air Forces (PACAF)
- (6) Strategic Air Command (SAC)
- (7) Space Command (SPACECOM)
- (8) Tactical Air Command (TAC)
- (9) United States Air Forces in Europe (USAFE)
- (10) Other (please specify) \_\_\_\_\_

64. How many people do you directly supervise (i.e., those for which you write performance reports)?

- (1) None
- (2) 1 to 2
- (3) 3 to 5
- (4) 6 to 8
- (5) 9 to 12
- (6) 13 to 20
- (7) 21 or more

65. How many full years of total military commissioned active duty service do you have?

- (1) 0 to 3
- (2) 4 to 7
- (3) 8 to 11
- (4) 12 to 15
- (5) 16 to 19
- (6) 20 or more

ITEMS 66 AND 67 ASK FOR YOUR CURRENT DUTY AIR FORCE SPECIALTY CODE (DAFSC). PLEASE RESPOND TO ONLY ONE OF THE TWO ITEMS, AS APPROPRIATE.

66. Civil Engineering Utilization Field (55XX)

- (1) 5516
- (2) 5525A
- (3) 5525E
- (4) 5525F
- (5) 5525G
- (6) Other (please specify) \_\_\_\_\_

67. Development Engineering Utilization Field (28XX)

- (1) 2816
- (2) 2825
- (3) 2835
- (4) 2845
- (5) 2855
- (6) 2885
- (7) 2895
- (8) Other (please specify) \_\_\_\_\_

68. Which of the following degrees do you have?

- (1) Aeronautical Engineering
- (2) Architectural Engineering
- (3) Architecture
- (4) Astronautical Engineering
- (5) Electrical Engineering
- (6) Mechanical Engineering
- (7) Others that have qualified for the "Engineering Bonus"  
(please specify) \_\_\_\_\_

PLEASE RETURN THIS QUESTIONNAIRE WITH THE RESPONSE FORM IN THE RETURN ENVELOPE PROVIDED. THANK YOU FOR YOUR COOPERATION AND PARTICIPATION.

## Appendix C

### Request for Information from the ATLAS Database

28 April 1986

FROM: AFIT/LSH

SUBJECT: Request for Information from the ATLAS Database

TO: AFIT/DPW (Mr. Doran)

1. To support graduate student research in the School of Systems and Logistics, we request STICKY-BACK MAILING LABELS for Air Force officers who meet the following criteria;

- hold one of the following duty AFSCs:

2816	5516
2825	5525 A
2835	5525 E
2845	5525 F
2855	5525 G
2885	
2895	

- and, in the 28XX series, have a last digit SSN of 3, 7, 8 or  
in the 55XX series, have a last digit SSN of 0, 3, 4, 5, 6

- and who hold an academic education code (primary or secondary) in one of the following areas:

aeronautical engineering  
architectural engineering  
architecture  
astronautical engineering  
electrical engineering  
mechanical engineering

- and who have a TAFCS between 1 October 70 through 29 September 81.

2. This request should generate approximately 710 labels.

3. All information will be used in compliance with the provisions of the Privacy Act.

4. If you have questions or when the product is ready, please contact me at 56761 or 52254.

*Charles R. Fenno*

CHARLES R. FENNO  
Associate Professor  
Department of Communication  
and Research Methods  
School of Systems and Logistics

Ref: Miller

## Appendix D

### Survey Response Data

The following data matrix represents the responses to the questionnaire at Appendix B provided by the 120 Air Force engineering officers responding to the survey and used in this study. Each row corresponds to the responses provided by one of the 120 officers (i.e., row 1 is the responses provided by the 1st respondent, row 2 is the responses provided by the 2nd respondent, etc.). Each column corresponds to the responses provided for one of the 68 items on the questionnaire (i.e., column 1 is the responses to Item 1, column 2 is the responses to Item 2, etc.).

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→ Air Force development and civil engineering officers (n=120) were surveyed to determine how they perceived Engineering and Scientific Career Continuation Pay (ESCCP) and how pay, in general, affects their career decisions. Results indicated that these officers perceived ESCCP to be important in their career decisions if (1) they were not really sure about their intent to make the Air Force a career, (2) they had less than eight years of commissioned service, and (3) they were less than 31 years old. Out of the 19 motivational factors examined, salary was perceived to be the 17th most influential in career decisions. In addition, Air Force engineering officers perceived that they received less pay than their civilian counterparts. This study indicated that the use of ESCCP can influence the career decisions of some Air Force engineering officers.

*From the Memo, dated 11/15/64, Research  
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